

TELECOMMUNICATIONS IN THE FINANCIAL SERVICES INDUSTRY

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ABSTRACT:

The financial services industry is one of a small number of industry groups that is well known for its heavy reliance on telecommunications. Most financial services products would be impossible in their present-day form without telecommunications. Telecommunications in this context usually means a private telecommunications network, or an industry consortium network such as SWIFT. It is useful to break down the use of telecommunications within the industry into three categories, in descending order of importance: use of telecommunications as part of the production process (e.g. funds transfer); use of telecommunications to support trading activities by moving market information and allowing dealers or machines to negotiate deals; and general business support, such as administrative telephone conversations, electronic mail, and videoconferences. What is interesting is that there is an inverse relationship between importance and amount of bandwidth used. The industry does not have a uniform reliability/price requirement for telecommunications. Instead, it wants a little bit of "first class" bandwidth at a fair price, plus some more "business class" bandwidth at a lower price, then a large amount of "economy class" bandwidth at the best price it can get. Carriers and PTTs tend to think of bandwidth as fungible, and sometimes look at private networks as attempts by big companies to deprive them of revenue. Both these views are misinformed. Carriers and PTTs need to distinguish between different categories of use of telecommunications in designing and pricing their services.

INTRODUCTION

The financial services industry is one of the industry groups that is well known for its heavy reliance on telecommunications. Most financial services products would be impossible in their present-day form without telecommunications. Telecommunications in this context means a combination of private telecommunications networks, an industry consortium network such as SWIFT, and the public networks. This paper reviews the various categories of use of telecommunications in the financial services industry and highlights the fact that telecommunications services can no longer be sold by the carriers and PTTs in "vanilla flavor only": they must be tailored and priced to meet the needs of each category of use.

CATEGORIES OF USE OF TELECOMMUNICATIONS

In the financial services industry, and possibly other industries also, it is useful to break down the use of telecommunications into three categories:

- o General Business Support: the use of telecommunications to support general business activities, that is, for administrative and managerial communications, including telephone calls, electronic mail, videoconferences, and so on.
- o Product Support: the use of telecommunications to support product-related activities, but not to actually deliver the product itself. Most commonly, this category of use is associated with trading activities, as the means by which information about market prices is exchanged between dealers and by which dealers (or, in the future, machines) are able to negotiate deals with one another. Once a deal has been made, the actual execution process is generally carried via a separate network of the "product delivery" type.
- o Product Delivery: the use of telecommunications as part of the production process, that is, as an essential component in executing transactions on behalf of customers or delivering information to customers about their accounts.

Many industries only have the first category of use of telecommunications. Some have the first and second category of use. But few have all three.

Because the first category of use - for funds transfers, opening letters of credit, home banking, controlling cash machines, and so on - is the first thing that comes to mind when thinking of telecommunications and banking, there is a natural tendency for carriers and PTTs to assume that doing these things accounts for the lion's share of telecommunications capacity consumed by financial institutions. But they are wrong in making this assumption. Although this category of use is vitally important to financial institutions, it does not involve large amounts of bandwidth, as will be explained later. The reason for establishing this system of categorization is that financial institutions tend to have radically different strategies for selecting telecommunications facilities for each category of use.

TELECOMMUNICATIONS STRATEGY FOR GENERAL BUSINESS SUPPORT

In the telecommunications category of "general business support", financial institutions are generally happy to use public telecommunications networks, such as the public telephone and telex networks, as long as they provide a service that is both reliable and capable of meeting the needs of the business. However, private network facilities will be used instead where there are significant cost-saving opportunities that would be foolish to ignore, or where there is no public network that meets the needs of the business.

An example of a worthwhile cost-saving opportunity is inter-office telephone service on a heavily used route such as New York/London, where leased circuit rentals are less than the cost of the public network telephone calls that they can displace. Some banks have taken advantage of these kinds of opportunities to the fullest extent possible. Others have found that the demands on scarce technical staff caused by the need to keep voice networks working to the satisfaction of users have, up until now, made such efforts

unrewarding. However, with the growing availability of digital circuits it is becoming less arduous to maintain acceptable quality levels.

An example of a network which provides a service not available from public service providers is global intra-company electronic mail. While some countries have public electronic mail services, the links between the public electronic mail services in different countries are at an early stage of development. More importantly, they do not provide user-friendly addressing schemes for a company. By contrast, an internal electronic mail network can be set up to allow users to address messages to one another using the addressee's name, rather than an unfriendly identification code like "73:THX1138".

TELECOMMUNICATIONS STRATEGY FOR PRODUCT SUPPORT

In the telecommunications category of "product support", financial institutions are more inclined to seek solutions that do not rely on public networks, even when such solutions cost more than public network alternatives. This is because this category of use of telecommunications is one in which a competitive advantage can be gained through having faster or more efficient communication than a competitor. Information about markets and about events that affect markets has a value that declines rapidly with time, so a network based on leased circuits that can shave a few seconds off the time taken to move information around the world can pay for itself several times over in terms of more advantageous trades that can be made.

Where opportunities can be identified to combine facilities that provide product support with those that provide general business support, these will be pursued as long as the end result does not compromise the reliability and speed of the product support telecommunications.

Typically about 10% of a global bank's telecommunications costs belongs in the product support category (possibly more where the bank specializes in trading-type activities).

TELECOMMUNICATIONS STRATEGY FOR PRODUCT DELIVERY

In the telecommunications category of "product delivery", financial institutions' main concern is with achieving very high reliability and security. Also, for some types of product, costs must be carefully controlled. These two objectives are generally in opposition to one another. As a result, planning for product delivery involves some difficult trade-offs.

Communication for product delivery involves the movement of small volumes of data. For instance, a corporate funds transfer typically involves the movement of as few as 2000 bits of data, and a credit card transaction authorization as few as 500 bits. By contrast, a five-minute inter-office telephone call, when translated into common digital terms, consumes 19,200,000 bits of data transport capacity in both directions. When

PTTs and carriers look hungrily at banks as a source of revenue, under the assumption that banking involves a lot of data movement, they make the mistake of assuming that a lot of transactions means a lot of data. While it is true that there are a lot of transactions (many tens of thousands of corporate transactions and many hundreds of thousands of consumer transactions each day), the total telecommunications capacity used is small in relation to the other categories of telecommunication use. For example, Citibank's links that carry all the corporate funds transfers between Asia and the USA (which, in dollar values, equate to the movement of the entire world's money supply every 30 days) use a total bandwidth of only 2400 bits per second.

The need for careful control of costs on this category of telecommunications use arises from the fact that the revenue per transaction is small, so that excessive telecommunications costs can make the activity unprofitable. For example, the cost of an authorization for a credit card transaction is paid for out of the small share of the transaction value that the credit card company takes from the retailer. On a US\$50 purchase, the credit card issuer may take about US\$2. This has to cover all the costs for processing that transaction, of which authorization of the transaction from the point of sale is only a small part (say, 25 cents). The authorization itself involves the use of computer resources, which have a cost (say, 20 cents), so we end up with a ceiling of only about 5 cents on the telecommunications costs associated with the authorization.

One way of achieving the required combination of low costs and high reliability is to piggyback the facilities used for product delivery on top of those used for product support and/or general business support. For example, the underlying data transport facilities used to carry administrative messages via electronic mail can also serve product delivery applications such as corporate funds transfer, or cross-border on-line opening of letters of credit. However, the design of the overlay network for product delivery must include a level of redundancy that may be missing from the underlying transport facilities.

Another way of achieving low costs and high reliability is to establish an industry-specific shared network such as SWIFT. In SWIFT, the traffic for all banks is pooled, achieving economies of scale, and the network is operated by a staff whose efforts are concentrated on achieving extremely high levels of reliability. (As a network, SWIFT is also able to be accountable to its members in a way that PTTs are both legally and practically unable to be, particularly on a global basis.)

HOW FINANCIAL INSTITUTIONS GO SHOPPING FOR TELECOMMS SERVICES

When financial institutions go shopping for telecommunications services their first priority is services to be used for product delivery. In most cases this means low-capacity leased circuits to interconnect message switching systems and to interconnect multiplexers or packet switches that carry real-time transactional messages, such as credit card authorizations. The private networks formed by these switches and multiplexers are typically designed to have a high degree of redundancy in terms of nodal hardware and alternate circuit routes, so that they can survive failures of all types.

In some cases financial institutions may use the public switched networks (either data, telephone, or both) as backups to the leased circuits in their networks in the event of circuit failures.

The bandwidth rented for product delivery can be thought of as "first class" bandwidth. Relatively little of it is demanded, and it must be of high quality (low error rates, infrequent failures). Although this bandwidth is vital to the institution's business, this does not necessarily mean that the PTTs and carriers can charge the earth for it, so in this respect the term "first class" is not wholly appropriate. As mentioned earlier, some transactional services have very thin profit margins and so unacceptable telecommunications costs can lead to some institutions deciding to abandon a particular product line.

Having satisfied its appetite for services for product delivery, a financial institution next looks for somewhat larger amounts of bandwidth (or switched services) for product support. This can be thought of as "business class" bandwidth. Improvements over "economy class" switched telephone service can be turned to competitive advantage. For example, leased circuits give traders faster communication from trading center to trading center. Also, more leased circuit capacity may be added to private data networks to carry market data from location to location. This extra bandwidth does not need to be quite as reliable as that used for product delivery, because there are readily available fallbacks, such as simply making a telephone call. However, the business manager will look at the trade-off between more bandwidth and potential extra revenue and decide on the level of product support via telecommunications that he or she will aim for.

Finally, a financial institution will go shopping for the largest part of its telecommunications capacity - for general business support - with value in mind. This is the "economy class" bandwidth.

WHAT THIS MEANS FOR THE SUPPLIER

It is important for the PTTs and carriers to address each category of use of telecommunications separately. A financial institution does not want "vanilla flavored" services for all its telecommunications needs. For instance, suggestions made by some PTTs that banks might find the public data networks or X.400 networks a substitute for SWIFT are treated with scorn by the banks. The banks see such suggestions as an indication of the PTTs' failure to understand their customers. As another example, some of the less liberal PTTs make noises from time to time about ceasing to provide leased circuits because they are simply being used by companies to "bypass the public networks".

These PTTs are wrongly assuming that all leased circuits are used to undercut the public network tariffs. In fact, a large number of leased circuits are used for direct voice communication between traders' boards so that traders can call one another in a split

second, rather than taking up to 30 seconds for a dialed call. Other leased circuits are used in specialized private networks for product delivery, for which the public networks are not acceptable.

When trying to sell more bandwidth, PTTs and carriers also need to be aware of price sensitivity. Up to a point, financial institutions' demand for first-class bandwidth (for product delivery) is inelastic. They will not rush out and buy more of it just because it is cheaper. However, demand for business-class bandwidth (for product support) is somewhat elastic: if leased circuit prices fall, or discounts are offered for quantity, then it may become attractive to use more circuits to support the entry into new markets, particularly in the distribution of market data.

Demand for economy-class (general business support) bandwidth is fairly elastic. If prices are high then a financial institution will use the minimum in terms of telephone calls and fax. But if quantity discounts are available, for instance, for high capacity digital circuits, then new forms of communication will be added. Obvious examples are videoconferencing, internal videotex, electronic mail, and PC-to-PC file transfers.

While some of these types of communication may offset other costs, for instance, videoconferencing replacing travel, or electronic mail replacing paper mail, most companies have found that new forms of communication become extra communication, not substitutes. In other words, falling bandwidth costs stimulate demand for extra communication.

THE OTHER SIDE OF THE COIN

Having said all this about the need for the customizing and pricing of services to meet the needs of each category of use, I am now going to somewhat destroy my own theory by showing how the introduction of high capacity digital circuits and ISDN makes this kind of segmentation (a) more necessary for the PTT/carrier that wants to prevent erosion of its revenue base, (b) more difficult for the PTT/carrier to do, and (c) less important to the customer!

One problem that the PTTs and carriers face in pricing their services is that digital bandwidth is fungible, that is, you cannot tell one piece of it from another piece. This means that companies that have effective uses for large amounts of bandwidth (e.g. videoconferencing) can use parts of this cheap bandwidth for the essential services (like product delivery). What they do is to make their essential (first class) service piggyback on top of their less essential ones, thus lowering their total costs. With a bit of careful planning they can make sure that they have enough redundancy in their private networks to achieve high reliability on the first class services, while still paying less than before. They are effectively getting a "free upgrade".

This situation will become increasingly talked about with the introduction of ISDN. The basic issue is an economic one: how do you tap a customer's marginal utility curve for

bandwidth? Many other other industries solved this problem a long time ago, by having sliding price scales. In telecommunications, the idea of the 1000th telephone call costing less than the first telephone call is so alien to the industry that the concept has not been applied very extensively to any of the telecommunications services.

Although these comments run against the theme of the main theme of this paper, they still underline the importance of understanding what the customer is doing with the various telecommunications services that he is buying.

CONCLUSION

Financial institutions set up private networks primarily to carry out "product delivery", for example, to execute funds transfers on behalf of customers. They may extend these for "product support", that is, supporting trading and other activities by facilitating deals and transactions, rather than actually executing them. These private networks are not aimed at depriving PTTs and carriers of revenue. They are aimed at providing highly reliable and/or fast services that the public switched networks cannot offer.

But when it comes to telecommunications for "general business support", financial institutions look for a good deal, just like any other customer. PTTs and carriers should understand these different categories of use when trying to sell services.

PTTs and carriers should also understand that the consumption of growing amounts of digital bandwidth for general business support (leased circuits and, in the future, ISDN) is providing the opportunity for product delivery and product support networks to piggyback on top of the general business support services, thus reducing the financial institution's costs and the PTT/carrier's revenue. By thinking "bandwidth is fungible" in their marketing of services, the PTTs and carriers may be helping to make it come true.

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